PROPOSALS FOR THE STRATEGIC DIRECTION OF TAGULSKOYE OIL FIELDS IN THE ARCTIC ZONE KRASNOYARSK REGION

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Oil fields constitute one of the main natural resources of Russia [1]. However, how organize oil transit in the "consumer's house"? What are the best ways to develop the Tagulskoye oil field? The relevance of this study is provided by solutions to the development of the Tagulskoye field in the Arctic region, which is part of the mainland of the north of the Krasnoyarsk Territory. The high level of Russia's industrial and energy potential ensures the possibility of intensive development of the richest minerals, such as oil and natural gas, explored in permafrost regions [2].

The purpose of this work was the development of proposals on options for the development and development of the Tagulskoye oil field in the Arctic region of the mainland of the Krasnoyarsk Territory.

In accordance with the goal, the following tasks were defined:

1) To assess the strategic location of the projected field in relation to the previously economically exploited territories and transport routes of the region.

2) Consider options for transporting oil products and analyze them.

3) Analyze legal issues related to the use of land on which the Tagulskoye deposit is located.

The object of this study is the projected Tagulskoye oil field, which is explored in the north of the Krasnoyarsk Territory, in the Turukhansk region at a distance of about 1.7 thousand km from the city of Krasnoyarsk. The reserves of the field are about 10.6 million barrels of oil (1464500 tons). The complex development of this field is planned by JSC «Rosneft» for 2018. The reserves of this field account for 0.3% of the country's total oil production [3]. The area of the field is about 1500 square kilometers, including about 1100 hectares of engineering infrastructure: bushes of production wells, pipelines, industrial enterprises and technical facilities (workshops, warehouses, etc.), a ramified network of highways [3].

For the development of the Tagulskoye deposit, transport support options have been proposed for the delivery of field products to consumers, as shown in the figure.

Fig. Scheme of strategic development directions of the Tagulskoye oil field: 1,2,3-variants of strategic directions [4]

There are three such options, with the following rationale:

To create on the basis of this deposit a town-planning object (city or settlement), including an oil refinery. The export of finished products is to be provided by rail to the river port of Igarka, accessible to sea vessels to the Yenisei River exit to the Northern Sea Route. The main products of oil refining are: "light" processed products such as gasoline and kerosene, "heavy" - diesel fuel, as well as bitumen (obtained for road construction). The forecasted processing volumes are 10.6 million barrels = 1464500 tons of oil. From this volume of raw materials can be obtained: gasoline - 1.2 million tons, kerosene - 1.4 million tons, diesel fuel - 1.4 million tons and bitumen - 2.1 million tons. At the same time, for transportation of oil products with a cargo capacity of 60 tons, it will be necessary: for petrol - 19944, for kerosene - 22894, for diesel fuel - 23456 and for bitumen - 34411 cisterns.

Use the project variant of laying the pipeline parallel to the projected railway to the port of Igarka, and then by vessels to export crude oil to the south of the country. The length of the pipeline is approximately 132 km.

Laying on the left-sided floodplain of the Yenisei River an oil pipeline for pumping crude oil to the existing oil refinery in the city of Achinsk, at a distance of about 1282 km from the Tagulskoye field.

The results of the indicators on the options are given in the table.

Table

Variants of the strategic direction of development of the Tagulskoye field

Indicator name	Options for the strategic development of the Tagulskoye field		
	1	2	3
1. Name of mineral	Oil		
2. City-forming significance	+	-	-
3. Social importance for the region	+	-	-
4 . Production volume	10.6 million barrels of oil (1464500 tons)		
5 . Production	Petroleum products	Raw oil	Raw oil
6. Additional infrastructure	Oil refinery and town-planning facility	Pipe, road, power line	Pipe, road, power line
7 . Type of transport	Railway transport	Pipeline	Pipeline
8 . Range, km	322	132	1282
9. Metal consumption, tonne	257600	105600	1025600

In our opinion, for the industrial, economic and social development of the Arctic region within the mainland of the Krasnoyarsk Territory, the first option is preferable (see table).

This territory should be disbanded and leased for a certain period of time to the organization of JSC "Rosneft" with the provision of all requirements for the protection of the natural environment of this territory. The Tagulskoye deposit is located on the lands of the forest fund. According to the Forest Code, the lands of the forest fund are in federal ownership. Therefore, there is a need to transfer these lands to non-forest land for use for purposes other than forest management, as well as for geological exploration.

Thus, variants of proposals for the development of the Tagulskoye oil field in the Arctic zone of the Krasnoyarsk Territory were developed and considered. These proposals should be further refined by detailed technical and economic studies, first of all, to address issues of economic development of this field, taking into account the development of the transport scheme of this region.

References

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THE PROBLEM OF IMPLEMENTATION HIGHER MATHEMATICS KNOWLEDGE IN PROFESSIONAL SPHERE

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At the end of the third semester of studying in universities on the program for the preparation of bachelors of the "Oil and Gas Engineering" students have a certain "baggage of knowledge" in higher mathematics. It is intended for further use in solving problems related to the specialty. However, in further work in the field of professional research, "underwater stones" come to light, which nobody paid attention through the course of higher mathematics, and sometimes they were simply ignored.

A vivid example of such a disregard for knowledge is the use of different coordinate systems in solving practical problems. Everyone knows the simplest and therefore often used Cartesian coordinate system, it`s familiar to us from school. However, in such a specialty as drilling oil and gas wells, calculations in a rectangular coordinate system can be quite cumbersome. Therefore, when designing a borehole, for example, it is very useful to use a cylindrical coordinate system, because the borehole itself has the shape of a cylinder. It is a three-dimensional coordinate system that is a generalization of the polar coordinate system by adding a third coordinate that specifies the displacement of an arbitrary point M along the OZ axis with respect to the coordinate plane OXY [3]. In the previous work [3], the application of this coordinate system to the calculation of the load on the well contour and the features of working with this system in the mathematical package MathCAD were considered.